

### REMARKS

Applicants respectfully request reconsideration of this application as amended. Claims 1-25 are pending in the application. Claims 1 and 16 have been amended.

The Examiner objected to the title as being too verbose. Applicants have replaced the title with the title suggested by the examiner. Applicants respectfully submit that the new title overcomes the Examiner's objection and respectfully request the Examiner to withdraw the objection.

The Examiner objected to the drawings as not showing all the claimed features. Specifically, the Examiner indicated that the claimed "excitation function" is not shown in the figures. Applicants respectfully disagree. Figure 1 discloses an excitation module 12 that generates an excitation function identified in the drawing and the text of the application as  $u(n)$ . In Figure 1, a series of voice pulses 13 are shown along with excitation pulses 14. Applicants respectfully submit that this satisfies the obligation to show the excitation function in the figures. Applicants respectfully request the Examiner to withdraw the objection to the drawings.

The Examiner objected to the specification due to informalities. Applicants have amended the specification to remove the problems cited by the Examiner. Applicants respectfully request the Examiner to withdraw the objection.

The Examiner rejected claims 1-25 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Specifically, the Examiner states that joint optimization is not clearly taught by the Applicant. Applicant respectfully disagrees. Joint optimization is taught. Essentially, excitation function and roots of the synthesis polynomial for the excitation function are selected to reduce the synthesis error produced by the synthesis filter. As described, the selection of these two items is performed to obtain the optimum combination

of excitation function and roots of the synthesis polynomial. The manner in which the excitation function and roots of the synthesis function are selected is clearly described in the specification. For example, see page 9, line 13 to page 17, line 24. In view of the above, Applicant respectfully requests the Examiner to withdraw the rejection.

The Examiner rejected claims 1-25 under 35 U.S.C. § 112, second paragraph. Applicants have amended the claims to overcome the rejection. Applicants respectfully request the Examiner to withdraw of the objection.

The Examiner rejected claims 1-8, 12, 16, 17, and 19 under 35 U.S.C. § 102(b) as being anticipated by Kroon (U.S. 5,664,055). Applicants respectfully disagree. The present invention as sets forth in claim 1 as amended includes the following:

A method of digitally encoding speech, comprising  
generating an excitation function using an excitation module, said excitation function comprising a number of non-zero pulses within an analysis frame separated by spaces therebetween;  
generating synthesized speech using a synthesis filter from said number of non-zero pulses within the analysis frame without contribution; and  
performing synthesis filter optimization, including selecting one of a plurality of excitation functions and selecting roots of the synthesis polynomial for one excitation function that minimizes a synthesis error produced by the synthesis filter.  
(emphasis added)

As set forth above, claim 1 includes selecting an excitation function and roots of the synthesis polynomial of the excitation function that minimize the synthesis error produced by the synthesis filter creating synthesized speech. Selecting both to minimize a synthesis error is a joint optimization. The examiner admits that joint optimization is not shown in Kroon. Therefore, Applicants respectfully submit that the present invention as claimed is not anticipated by Kroon.

More specifically, Kroon discloses a speech decoder that selectively generates the excitation signal based on signals from the decoder. Kroon does not teach, mention nor disclose

joint optimization of the model and the excitation function, and is silent with respect to selecting roots of the synthesis polynomial as part of the processing with selecting the excitation function. In view of this, Applicants respectfully submit that the present invention as claimed is not anticipated by Kroon.


The Examiner rejected claims 9-11, 13-15, 18 and 20-25 under 35 U.S.C. § 103 as being unpatentable over Kroon (U.S. 5,664,055) in view of Chen. As set forth above, Kroon does not disclose selecting excitation function and roots of the synthesis polynomial for the excitation function to minimize the synthesis error produced by a synthesis filter. Chen does not overcome this deficiency. More specifically, Chen discloses an optimizer that operates in a coefficient domain, not the root domain. Operating in the root domain is much faster mathematically and more stable. Therefore, the combination of Kroon and Chen does not disclose each of the limitations in the claims. Thus, Applicants respectfully submit for the same reason as given above, the present invention as claimed in claims 9-11, 13-15, 18 and 20-25 are not obvious in view of Kroon and Chen.

If there are any additional charges, please charge Deposit Account No. 02-2666 for any fee deficiency that may be due.

Respectfully submitted,

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